

Appl. No. 10/814,408  
Atty. Docket: 2002B139/2  
Amendment dated June 20, 2006  
Reply to Office Action dated April 20, 2006

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### **REMARKS/ARGUMENTS**

#### **Claim Status and Request for Reconsideration**

Reconsideration of this application is requested. The claims presented for reconsideration are claims 24 and 30-33.

Claim 24 has been amended to include a catalyst circulation control valve consistent with the description in the specification at page 9, penultimate paragraph. Claim 33 is newly added. This claim is based on the description in the specification at paragraph [0115].

The specification has been amended to clarify the relationship between the numbered elements in the Figure and the description of those elements in the specification. Accordingly, no new matter has been added by way of this Amendment and Response. Entry of the amendment is requested.

#### **Drawing Objection**

Figure 1 was objected to for failing to comply with 37 C.F.R. § 1.84(p)(5) because it did not include certain reference numbers mentioned in paragraphs [0113] and [0116]. Those particular paragraphs have been amended to address the objection issue. The amendment, therefore, renders this objection moot.

#### **Claim Rejections - 35 U.S.C § 103**

Claims 24 and 30-32 were rejected under 35 U.S.C. § 103(a) as being obvious over Hirsch *et al.* (U.S. Patent No. 2,892,773) in view of Hofferber *et al.* (U.S. Patent No. 4,092,722). This rejection is traversed.

The claims can be more completely explained by referring to Figure 1. In the particular embodiment shown in Figure 1, the temperature within a riser portion of the reactor is used as a control point to control catalyst activity. In this case, catalyst activity is controlled by controlling the amount of coke on the overall catalyst composition that comes into contact with the feed. One way to do this is to control the amount of catalyst that is flowed through the regenerator and circulated back into the reactor to combine with unregenerated catalyst, and ultimately contact feed to the reactor.

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As discussed in Applicants' specification, catalyst activity is a function of the amount of coke on the catalyst. In general, the more coke on the catalyst, the lower the activity. However, a certain amount of coke is desirable in order to increase the selectivity of the catalyst to form light olefins, such as ethylene and propylene, from the oxygenate feed. Either the amount of coke on each of the catalyst particles can be controlled through a partial regeneration process, or the overall coke composition can be averaged through a total regeneration process. In this invention, the overall coke composition in the riser reactor is affected by the use of a regenerator catalyst circulation valve and a catalyst circulation control valve.

The claims also concern the ability to affect space velocity through the reactor. This can be accomplished, at least in part, by appropriately controlling catalyst circulation from the disengaging vessel to the riser reactor. Control of catalyst circulation in this manner can make a significant impact on selectivity to specific olefin product formation and on conversion.

Applicants' claimed invention can be more fully described by the particular embodiment shown in Figure 1. In that embodiment, regenerated catalyst is combined with unregenerated catalyst circulating through a bypass loop. The combination of regenerated catalyst and unregenerated catalyst can be manipulated by an appropriate control valve arrangement to provide the desired catalyst activity. The amount of coke on the catalyst circulated to the riser and the amount of catalyst entering the riser are controlled by the use of temperature and pressure control valves on a line connecting the regenerator and disengaging vessel and on a line connecting the disengaging vessel to the feed inlet location of the riser.

The cited Hirsch patent discloses a type of fluidized bed reactor that includes a riser reactor. The Hirsch device, however, differs from the claimed invention in that Hirsch does not have a regenerator catalyst circulation control valve capable of being manipulated as a function of riser reactor temperature. The Hirsch device further differs from the claimed invention in that Hirsch also does not have a catalyst circulation control valve that is capable of controlling circulation of catalyst from the disengaging vessel to the riser reactor as a function of the difference in pressure between an upper portion of said riser reactor and a lower portion of said riser reactor. Although Hirsch does include a pressure type control valve system, that control valve controls flow of catalyst from the regenerator to the Hirsch hopper. This type of

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arrangement is not similar to the claimed invention. Thus, Hirsch in and of itself fails to disclose or suggest all the elements of Applicants' claimed invention.

Hofferber was cited for disclosing a regenerator catalyst control valve that controls catalyst flow as a function of temperature. The Hofferber control valve, however, differs from Applicants' claimed invention in that the Hofferber valve does not disclose a regenerator catalyst circulation control valve that controls flow of catalyst from the regenerator outlet to a lift gas riser that has an upper outlet at the disengaging vessel. Instead, the Hofferber control valve is situated to control flow from the regenerator directly to reactor riser 3.

Hofferber also differs from the claimed invention in that Hofferber does not disclose a catalyst circulation control valve that is capable of controlling circulation of catalyst from a disengaging vessel to the riser reactor. There is simply no disclosure of this type of control valve in Hofferber, in Hirsch, or in their combination. Thus, even when combined, Hirsch and Hofferber disclose structure that is completely different from the claimed invention. Accordingly, the combination of Hirsch with Hofferber fails to disclose or suggest the type of apparatus claimed by Applicants.

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### CONCLUSION

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, and all other formal issues having now been fully addressed, this application is in condition for allowance. Accordingly, applicants request early and favorable reconsideration in the form of a Notice of Allowance.

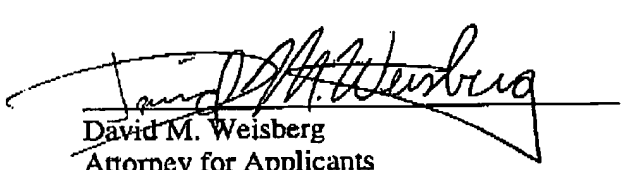
If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2002B139/2).

Respectfully submitted,

Date: \_\_\_\_\_

6/20/06

  
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